Claims

[1] A motion converting mechanism comprising a reciprocating member (1) and a rotating member (7);

said reciprocating member (1) comprising at least two roller cam followers (5) in substantially constant distance from each other;

said rotating member (7) comprising a cam (9);

for each rotation of the cam (9) only one reciprocation of the reciprocating member (1) takes place;

characterized in that:

the centers of the roller cam followers follow curves, relative to the cam, having an eccentricity E(f) which is related to the displacement Y(f) of the reciprocating member (1) substantially by the formula:

E(f+f1)=square root ((a + Y(f))^2 +d^2), with f1=Arctan ((a+Y(f))/d), where f is the rotation angle of the cam, d is half the distance between the axes of reciprocation of the centers of the roller cam followers and a is a constant;

while Y(f)+Y(f+π)=constant for any f;

thereby the same cam profile desmodromicly controls the reciprocation in both directions.

[2] A motion converting mechanism according claim 1,

characterized in that:

the profile of said cam (9) is such that the reciprocation of the reciprocating member (1) is substantially sinusoidal, versus the rotation angle f of the rotating member (7).

[3] A motion converting mechanism according claim 1,

characterized in that:

the reciprocating member comprises at least one roller (4) riding either on an immovable surface (16) or on a rotating cooperating cam (11) and bearing thrust loads at low friction to improve mechanical efficiency and reliability.

[4] A motion converting mechanism comprising a reciprocating member, at least two rotating external cams, not necessarily of the same size or number of lobes, and at least a thrust wall;

characterized in that:

the reciprocating member comprises a roller cam follower assembly, trapped among the cams and the thrust wall.

[5] A motion converting mechanism according claim 1,

characterized in that:

the resulting side loads are substantially carried by the rolling of rollers on

angularly displaceable thrust walls in order to provide variable compression ratio.

[6]   A motion converting mechanism comprising a reciprocating member and a rotating camshaft;

said camshaft comprising at least a first external cam and a second external cam;

said reciprocating member comprising a first roller cam follower and a second roller cam follower;

said first roller cam follower rides on said first cam with its center following a first centers curve relative to the camshaft;

said second cam follower rides on said second cam with its center following a second centers curve relative to the camshaft;

characterized in that:

the first cam and the second cam are complementary in the sense that any line from the center of rotation of the camshaft, intersects the first and the second centers curves in a sequence of four points A, B, C and D with AC=BD=constant and AB=CD.

[7]   A motion converting mechanism for desmodromic control of reciprocating valves comprising:

at least a cam having an eccentric groove and at least a cam follower sliding along said eccentric groove in substantially permanent contact to both sides of the groove;

characterized in that:

the cam follower is substantially longer than the width of the groove.